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Bronze fibula with three pinned-on rings from Crustumerium, Monte Del Bufalo burial ground, Tomb 153 (photo G.J.M. van Oortmerssen, RUG/GIA).

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PREHISTORIC OCCUPATION OF THE LOWER PONTINE PLAIN (LAZIO, CENTRAL ITALY): THE EVIDENCE FROM RECENT FIELD SURVEYS

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ABSTRACT: This contribution presents a study of 150 lithic artefacts from the lower Pontine Plain (Lazio, Central Italy), collected during field surveys carried out in the area between 2006 and 2014 by the Groningen Institute of Archaeology (GIA). Although these artefacts have no stratigraphic context, analyses of the composition of the survey assemblage and the distribution of the artefacts and previously recorded prehistoric materials allow us to make general observations on human occupation of the area between the Middle Palaeolithic and the Neolithic/Eneolithic. Thus this paper contributes to our understanding of how the wetland of the lower plain was exploited by hunter-gatherer groups and early farming communities.

KEYWORDS: Pontine Plain, prehistory, lithic studies, field survey, wetland exploitation.

1. INTRODUCTION

The Pontine Region Project (PRP) is a regional archaeological project that for almost thirty years has studied the long-term settlement history of the Pontine region (southern Lazio, Central Italy). Through landscape-archaeological research (systematic field survey; excavation; geophysical prospection; palaeo-environmental and geo-archaeological research; ceramic studies) the project has provided new insights into developments in settlement and land use in various parts of the region, focusing in particular on the time span between the Bronze Age and the Roman Imperial period (Attema 1993; Attema & Van Leusen 2004; Attema *et al.* 2010 and 2011; De Haas 2011; Tol 2012).

In its most recent phases, PRP field research has targeted the interior part of the Pontine Plain, an infamous wetland area. In 2007, a transect south of the Via Appia was intensively investigated with the aim of reconstructing Roman settlement and land-use patterns in this landscape zone (De Haas 2011: chapter 4). Subsequently, between 2012 and 2014, intensive surveys were carried out along transects around two Roman settlements on the Via Appia, Forum Appii and Ad Medias (Tol *et al.* 2014; Tol *et al.* forthcoming). Whilst focusing primarily on Roman-period activity, these investigations entailed the systematic collection of all encountered materials, which included c. 150 prehistoric artefacts.

The aim of this article is twofold: first, to fully publish the lithic data from the PRP surveys in the lower Pontine Plain; and second, to cautiously use these data as the basis for observations on prehistoric human occupation of the area. In the following, we will first present a brief overview of the current state of knowledge on the prehistory (Palaeolithic to Neo/Eneolithic) of the study area, discussing the development of the landscape and outlining prior research on its prehistoric occupation. We will then proceed to present the chronological and typological characteristics of the artefacts collected during GIA field surveys in the area. To conclude, we present an analysis of the distribution of the lithic artefacts, combining the PRP data with those of previous field surveys in order to detect spatial and chronological patterns.

2. THE PREHISTORY OF THE LOWER PONTINE PLAIN: STATUS QUO

2.1 Geology and landscape

The area under study roughly stretches between the 41st and 52nd mile of the Via Appia between present-day Borgo Faiti and Mesa di Pontinia and focuses on the low-lying inner part of the Pontine coastal plain (here referred to as the lower plain), which is enclosed to the northeast by the footslopes of the Lepine Mountains and

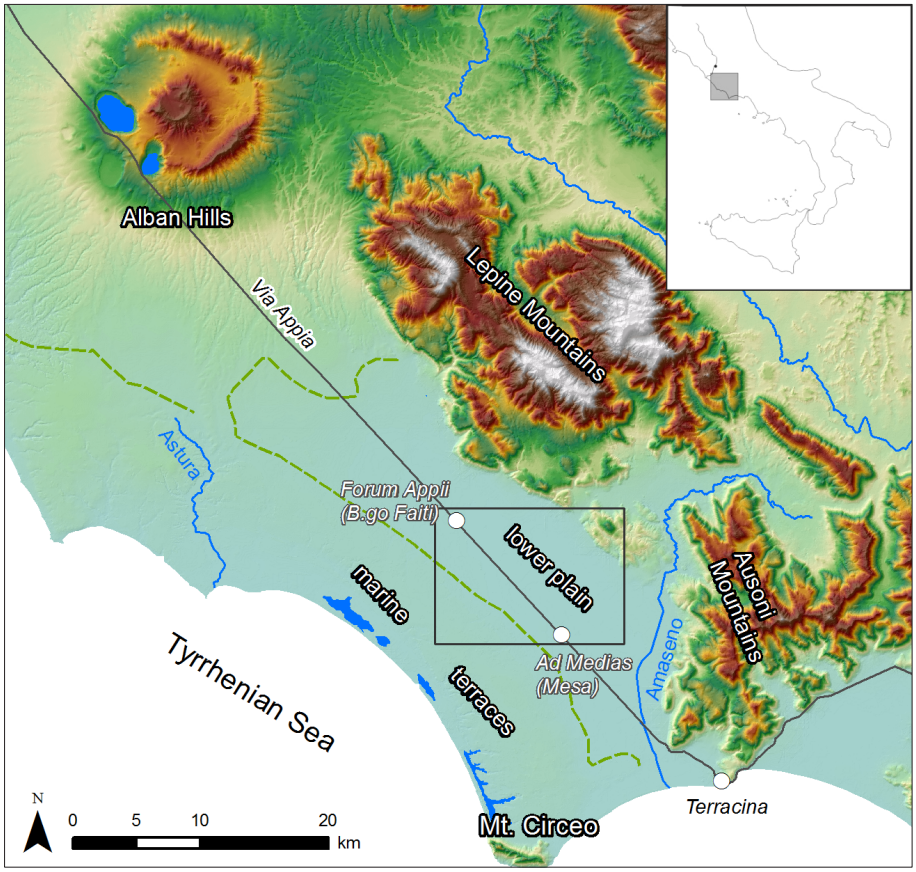

Fig. 1. Location of the study area within the Pontine region (T.C.A. de Haas).

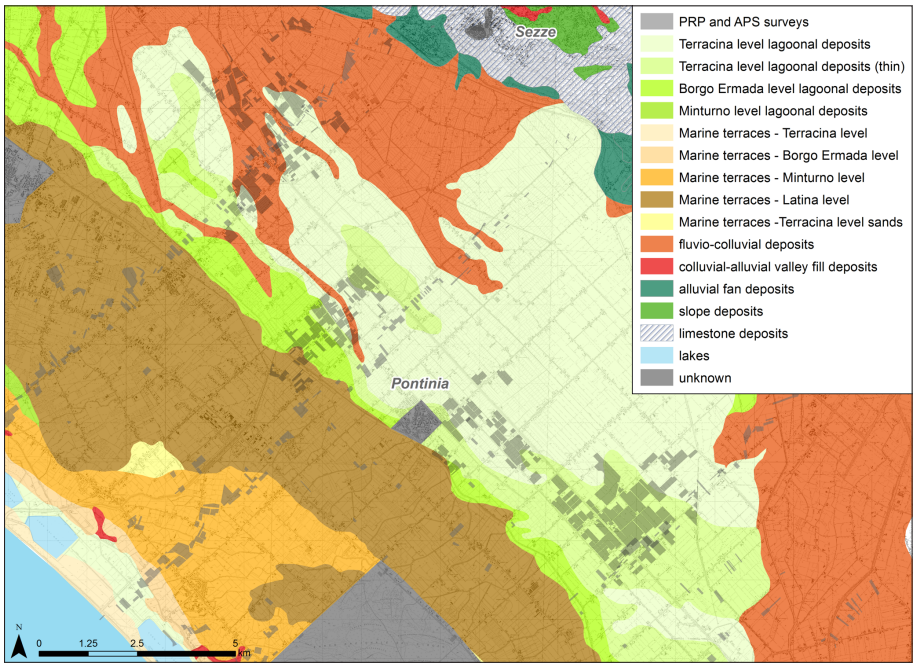

Fig. 2. Geological map of the lower Pontine Plain (T.C.A. de Haas, after Sevink *et al.* 1984).

to the southwest by four higher marine terraces, which run parallel to the Tyrrhenian coast (fig. 1).

These terraces originate from periods of marine sedimentation and beach-ridge formation dated to the Middle Pleistocene (the oldest, referred to as the Latina level), the Late Pleistocene (the Minturno and Borgo Ermada levels) and the Holocene (the Terracina level) (Sevink *et al.* 1982). They rise up to an elevation of c. 45 m above sea level. The lower plain itself is a graben, a geologically subsiding area, the larger part of which lies at an elevation of between 0 and 10 m above sea level (*cf.* Sevink *et al.* 1984; Feiken 2011: 5). In terms of surface geology it is

linked to the four marine terraces: it consists of peaty and clayey sediments that were deposited in an environment closed off from the sea by the higher marine terraces. Within the study area, the surface deposits are mainly those of the Borgo Ermada level, which were deposited in a marine to lagoonal environment, and of the Terracina level. To the northwest, more recent colluvial-alluvial deposits are found at the surface. Both these colluvial-alluvial deposits and the Terracina-level deposits cover part of the earlier prehistoric landscape, but as the Terracina-level deposits are often quite thin, the underlying Borgo Ermada levels and associated prehistoric remains may be present at the surface (fig. 2) (Sevink *et al.* 1984).

Recent geo-archaeological studies by Feiken (2014: 262) provide detailed landscape reconstructions of the Pontine graben from late prehistory into medieval times. For earlier periods (*e.g.* the Late Pleistocene and Early Holocene), information on landscape and vegetation development comes from the Mezzaluna pollen core (Hunt & Eisner 1991; revised in Eisner & Kamermans 2004), although its chronology has recently been shown to be unreliable as the radiocarbon datings suffer from the hard water effect (Sevink *et al.* 2013: 160-161). However, combined with other, reliably dated pollen cores (Mercuri *et al.* 2002) it does provide insight into the development of the landscape and associated vegetation relevant to the Upper Palaeolithic to Neolithic periods as discussed in the following.

In the Full Glacial, sea levels were tens of metres lower than today (Lambeck *et al.* 2004). The Pontine graben consisted of a flat, clayey plain, but its southeastern margin had a more varied landscape, with rivers cutting incisions (Sevink *et al.* 1984 and Sevink pers. comm.). The landscape and associated vegetation in this period varied according to climatic conditions (*e.g.* temperature and relative dryness): in drier and cooler periods it was characterized by *Artemisia* steppe vegetation with mesic herbs and water bodies in lower-lying wetter areas, especially near the springs along the foot of the Lepine Mountains. In warmer periods, the environment became wetter, with a more extensive lagoon surrounded by stretches of woodland (*Pinus* and *Quercus*).

As observed in the Alban Hills, the Early Holocene witnessed a rapid expansion of mesic forests (*Quercus*, and later also *Alnus* near the less well drained fens; *cf.* Mercuri *et al.* 2002: 270) and a disappearance of steppe vegetation. The lagoonal environment itself developed into a woodland swamp, which over time desiccated, allowing grasses and trees such as oak to expand. With the formation of a beach ridge between Terracina and the Monte Circeo (*cf.* fig. 1) further obstructing the lower plain's drainage to the sea, a freshwater lake developed in the lower plain, which was surrounded by woodland swamps, transitional riverine deltas and associated rivers (Sevink *et al.* 2013; Walsh *et al.* 2014: 32).

2.2 Prehistoric occupation

Archaeological research in the Pontine region attests to the richness of the prehistoric archaeological record and the abundance of Palaeolithic sites. The most ancient traces of human presence go back to the Lower Palaeolithic and have been recorded in the Astura river valley in the areas of Quarto delle Cinfonare and Campoverde (Peretto *et al.* 1997; La Rosa 1998). Traces of the Middle Palaeolithic have been found in different parts of the region and are well known from the caves of the Monte Circeo, including the Grotta Guattari (Taschini 1979), Grotta del Fossellone (Blanc & Segre 1953; Vitagliano & Piperno 1990-1991) and the Grotta Breuil (Bietti & Grimaldi 1996). Upper Palaeolithic occupation of the region is known not only from cave sites such as the Grotta del Fossellone (Aurignacian) (Blanc 1939; Blanc & Segre 1953) and Riparo Salvini (Epigravettian) (Alessio *et al.* 1993), but also from large Gravettian and Epigravettian open-air sites such as Colle Parito, Torre del Giglio and Torre del Padiglione (La Rosa *et al.* 1989-1990).

The first large-scale, systematic regional field survey project that specifically aimed to map prehistoric land use and settlement patterns in the region was the Agro Pontino Survey (APS). Between 1979 and 1989, it investigated six northeast-southwest oriented transects that cut across the various landscape zones of the region, with intensive field surveys within these transects (additional fields were surveyed outside the transects) (Loving *et al.* 1991; Loving & Kamermans 1991a). Although the results of this survey were never published fully, its raw data is available for study (Holstrom *et al.* 2004). The lithic data, published summarily in Loving & Kamermans (1991b) were used as the basis for a land evaluation by Kamermans (1993). The distribution of artefacts showed a clear correlation with the higher grounds provided by the marine terraces, on which both dispersed lithic artefacts and more discrete scatters with a higher artefact density were found. Moreover, on these marine terraces, along the coast, pebble beds provide raw materials for artefact manufacture (Loving & Kamermans 1991b: 108). However, some dispersed Middle Palaeolithic (particularly of the Pontinian Mousterian), some Early and Late Upper Paleolithic as well as Neo/Eneolithic artefacts were found in the graben as well (Loving & Kamermans 1991b: figs. 3-6).

The occurrence of relatively well-defined concentrations of finds on the marine terraces is also evident from several field surveys carried out within the PRP and by the first author (La Rosa 1984; La Rosa *et al.* 1989-90; La Rosa 2002; La Rosa 2011; Attema *et al.* 2005; Attema *et al.* 2008). More recently, additional lithic materials were collected during PRP investigations in the lower plain. The second author systematically collected all lithic artefacts during intensive gridded field surveys in a transect c. 3 km northwest of present-day Pontinia in 2007 (De Haas 2011: chapter 4). Between 2012 and 2014, additional materials were collected by the second and third

authors during gridded field surveys at the Roman road stations of Forum Appii (present-day Borgo Faiti) and Ad Medias (Mesa di Pontinia), both situated on the Via Appia, and during more extensive field-by-field surveys in their immediate surroundings (Tol *et al.* 2014; Tol *et al.* forthcoming).

The available evidence thus suggests that lithic materials representative of prehistoric occupation occur both in the graben and on the marine terraces, but are far more numerous and occur almost exclusively as well-defined find concentrations in the latter zone. Although the lithic assemblages have so far not been interpreted in terms of specific activities, we may suggest as a hypothesis that the higher marine terraces were frequented more regularly and that they saw a broader range of activities, including primary flint working. The lower plain was perhaps exploited less frequently and primarily for specific activities such as hunting and fishing, which left fewer material traces.

3. THE LITHIC MATERIALS COLLECTED DURING GIA SURVEYS IN THE LOWER PONTINE PLAIN: TYPOLOGY AND CHRONOLOGY

In general it is difficult to draw conclusions from lithics found at the surface during field surveys (Smit 2011). Although it is relatively easy to classify diagnostic artefacts typologically and to attribute them accordingly to a specific chronological-cultural period, it is much harder, if not impossible, to classify a-typical tools, waste and certain types of cores chronologically without a stratigraphic context (La Rosa 2011). In addition, field survey finds often consist of sparse artefacts of which it is unclear whether they represent truly isolated finds (*e.g.* deriving from occasional loss or activities that leave very few material traces) or represent the scant remains of sites that become clearly visible only after repeated and highly intensive surveying (*cf.* Niekus *et al.* 2011). Finally, when

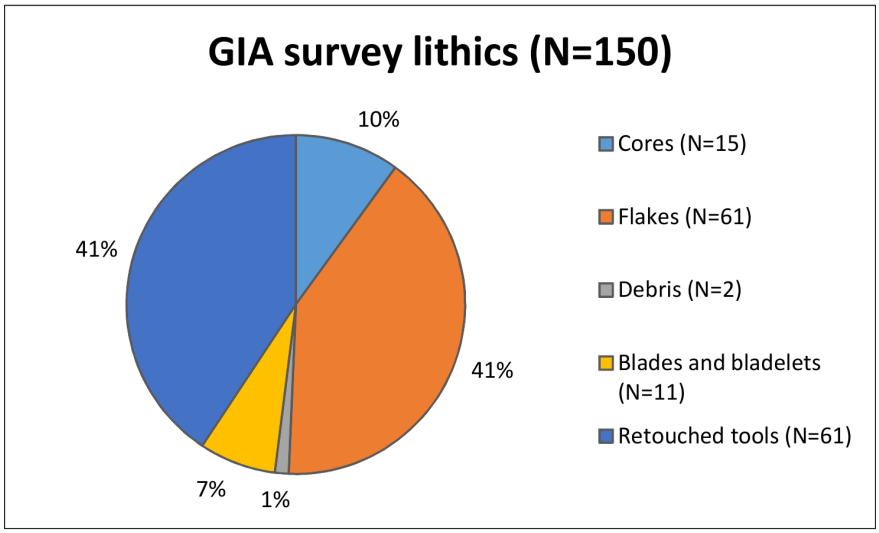

Fig. 3. Composition of the lithic industry collected during GIA surveys in the lower Pontine Plain (M. La Rosa).

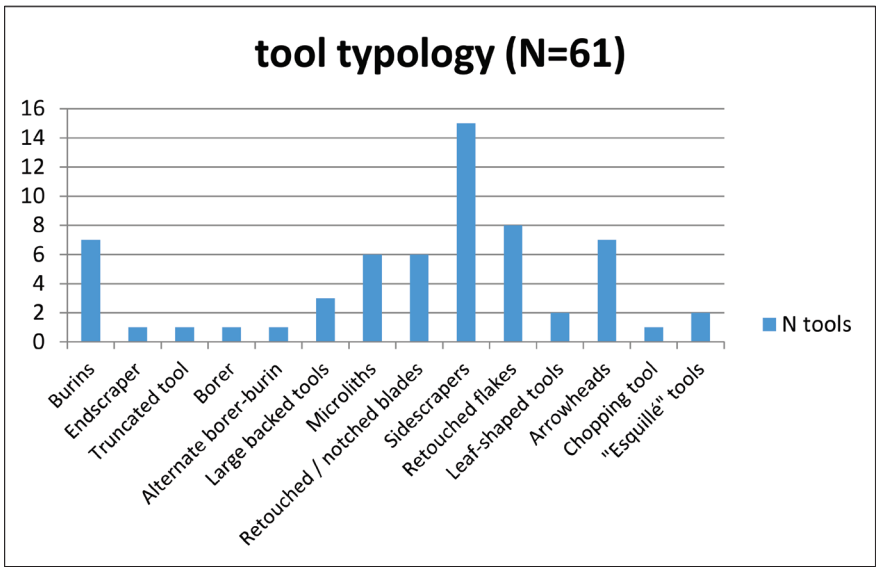

Fig. 4. Typology of the lithic tools from the GIA surveys (M. La Rosa).

Table 1. Debitage characteristics and typological classification of the lithics collected during GIA surveys in the lower Pontine Plain (MP = Middle Palaeolithic; UP = Upper Palaeolithic; Neo/eNeo = Neolithic or Eneolithic) (M. La Rosa).

	MP		**UP**		**Neo/eNeo**		**Undated**		**TOTAL**	
	No.	***%***	**No.**	***%***	**No.**	***%***	**No.**	***%***	**No.**	***%***
UNRETOUCHED BLANKS									**74**	***49.3***
Blades (unretouched)			8	*5.3*					8	*5.3*
Bladelets (unretouched)			3	*2.0*					3	*2.0*
Flakes (unretouched)					1	*0.7*	48	*32.0*	49	*32.7*
Levallois flakes	8	*5.3*							8	*5.3*
Pseudo-Levallois points	4	*2.6*							4	*2.6*
Debris							2	*1.3*	2	*1.3*
CORES									**15**	***10***
Flake cores and fragments							6	*4.0*	6	*4.0*
Cores with preferential Levallois flake	2	*1.3*							2	*1.3*
Centripetal cores	4	*2.7*							4	*2.7*
Bladelet cores			1	*0.7*	1	*0.7*			2	*1.4*
Flaked pebbles							1	*0.7*	1	*0.7*
TOOLS									**61**	***40.7***
Burins			7	*4.7*					7	*4.7*
Endscraper			1	*0.7*					1	*0.7*
Truncated tool			1	*0.7*					1	*0.7*
Borer							1	*0.7*	1	*0.7*
Alternate borer-burin							1	*0.7*	1	*0.7*
Large backed tools										
à *cran* point			1	*0.7*					1	*0.7*
Backed blade			1	*0.7*					1	*0.7*
Fragment of backed tool			1	*0.7*					1	*0.7*
Microliths										
Truncated bladelet			1	*0.7*					1	*0.7*
Pointed backed bladelet			1	*0.7*					1	*0.7*
Backed bladelets			2	*1.3*					2	*1.3*
Notched bladelets			2	*1.3*					2	*1.3*
Retouched blade			5	*3.3*					5	*3.3*
Notched blade			1	*0.7*					1	*0.7*
Sidescrapers	15	*10.0*							15	*10.0*
Retouched flakes							8	*5.3*	8	*5.3*
Leaf-shaped tools					2	*1.3*			2	*1.3*
Arrow heads					7	*4.7*			7	*4.7*
Chopping tool							1	*0.7*	1	*0.7*
Esquillé tools							2	*1.3*	2	*1.3*
TOTAL	**33**	***21.9***	**36**	***24.1***	**11**	***7.4***	**70**	***46.6***	**150**	***100***

encountered lithic materials do form spatially coherent scatters, these usually still have an extremely long chronology and may represent phases that witnessed very different uses or functions. Lithic scatters therefore form particularly complex palimpsests that are difficult to interpret in terms of changing patterns of human behaviour (Bailey 2007). However, their compositional characteristics may be cautiously used to investigate the different activities that may have been carried out at specific locations (*cf.* Smit 2011) or, as in the case of the materials gathered by the PRP in the lower plain, on the landscape scale.

The PRP surveys carried out in the lower Pontine Plain resulted in the collection of a total of 150 lithic artefacts, which were studied by the first author (fig. 3, table 1 and appendix 1). Diagnostic lithics were assigned, where possible, and at times with some reservation, to chronological and cultural periods that characterize the regional prehistory. The analysis was done on the basis

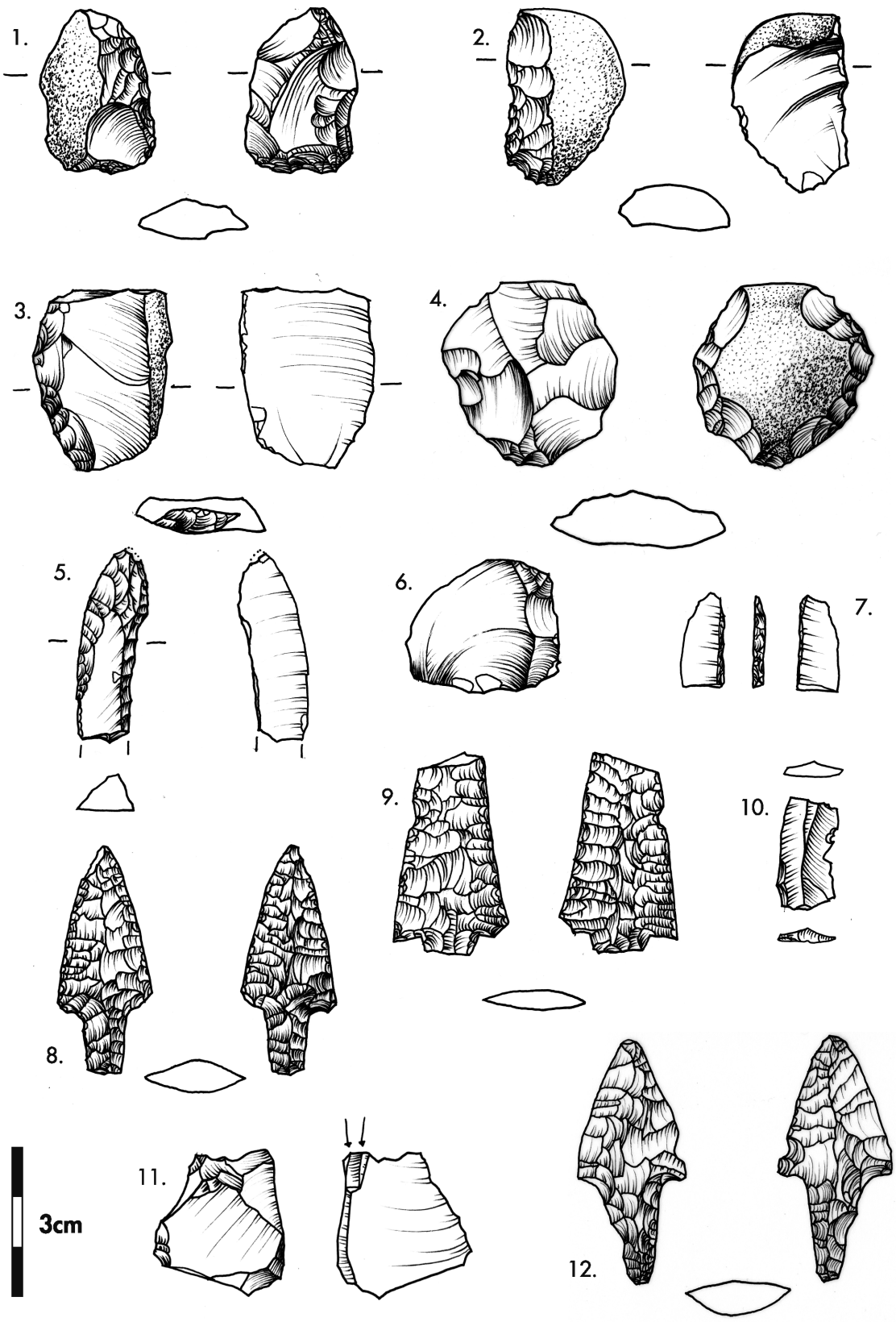

Fig. 5. Lithic artefacts from the GIA surveys (drawings Martina De Marzi). 1: *'a dos aminci'* sidescraper; 2: simple straight sidescraper; 3: simple convex side scraper; 4: centripetal core; 5: *'à cran'* point; 6: core with preferential Levallois flake; 7: backed bladelet; 8,9,12: arrowheads; 10: truncated bladelet; 11: angle burin on truncation.

of both techno-typological and stylistic considerations. In addition, dated prehistoric sites (Grotta Guattari, Grotta Breuil, Palidoro and Riparo Salvini) in the region (Alessio *et al.* 1993; Bietti 1976-77; Kuhn 1995; Schwarz *et al.* 1990-1991; Taschini 1979) were used for reference.

The studied artefacts were almost exclusively made out of flint pebbles; only two items were made from obsidian. The artefacts do not show traces of being transported and rounded by water or slope processes. Almost half of the lithic industry consists of unretouched blanks, the larger part of which are flakes, followed by unretouched blades and bladelets; only two fragments are debris (fig. 3).[1] Ten percent of the artefacts are cores, while 61 are retouched tools. This high proportion of tools in the assemblage probably reflects a preferential pick-up of such clearly recognizable artefacts by the fieldwalkers, who were trained primarily to recognize ceramics rather than lithics. Notably, 25 of these retouched tools are broken and twelve have a double patina, indicating that they had been re-retouched. Such recycling indicates that formerly discarded artefacts were used as raw material for making new tools.

Among the tools, sidescrapers are the most frequently attested (fig. 4 and table 1). They occur in different types: six are simple convex, three simple straight, and various other types (simple concave, double, *dejeté*, transverse, inverse and sidescraper *"a dos aminci"*) occur as single objects. Less frequent are the Neo/Eneolithic objects (seven arrowheads and two leaf-shaped tools), retouched flakes, burins, microliths, retouched blades and large backed tools.

Among the chronologically diagnostic artefacts (80 in total[2]), Upper Palaeolithic (36 items) are the most common, followed by Middle Palaeolithic (33 pieces) and Neo/Eneolithic (11 pieces). Middle Palaeolithic artefacts are representative of the Pontinian industry, the particular Mousterian industry characteristic of the coastal strip of southern Lazio (Blanc 1939; Taschini 1979; Kuhn 1995). The size of tools and some of their typological characteristics indicate that flint pebbles that occur naturally on the marine terraces, served as raw material (table 1 and fig. 4). Key elements are sidescrapers (fig. 5: nos. 1-3), Levallois flakes, pseudo-Levallois points, centripetal cores (fig. 5: no. 4) and cores with preferential Levallois flakes (fig. 5: no. 6).

Human presence during the Upper Palaeolithic is evidenced by 36 pieces, comprising not only blades and bladelets with or without retouch, but also burins (fig. 5: no. 11), an end scraper, a truncated tool, and large backed tools (an à cran point (fig. 5: no. 5), a backed blade, and a fragment of a backed tool); various microliths (fig. 5: nos. 7, 10) and the bladelet core may be attributed more specifically to the Epigravettian (Late Upper Palaeolithic).[3] Seven flint arrowheads (fig. 5: nos. 8-9, 12), two leaf-shaped tools and two artefacts made of obsidian (one bladelet core and one flake) indicate human occupation of the lower plain in the Neolithic or, perhaps, the Eneolithic.

The artefacts recovered during the GIA surveys attest to a range of activities carried out in the lower plain; for the Middle and Upper Palaeolithic these may have included the production of flint artefacts (perhaps mainly by

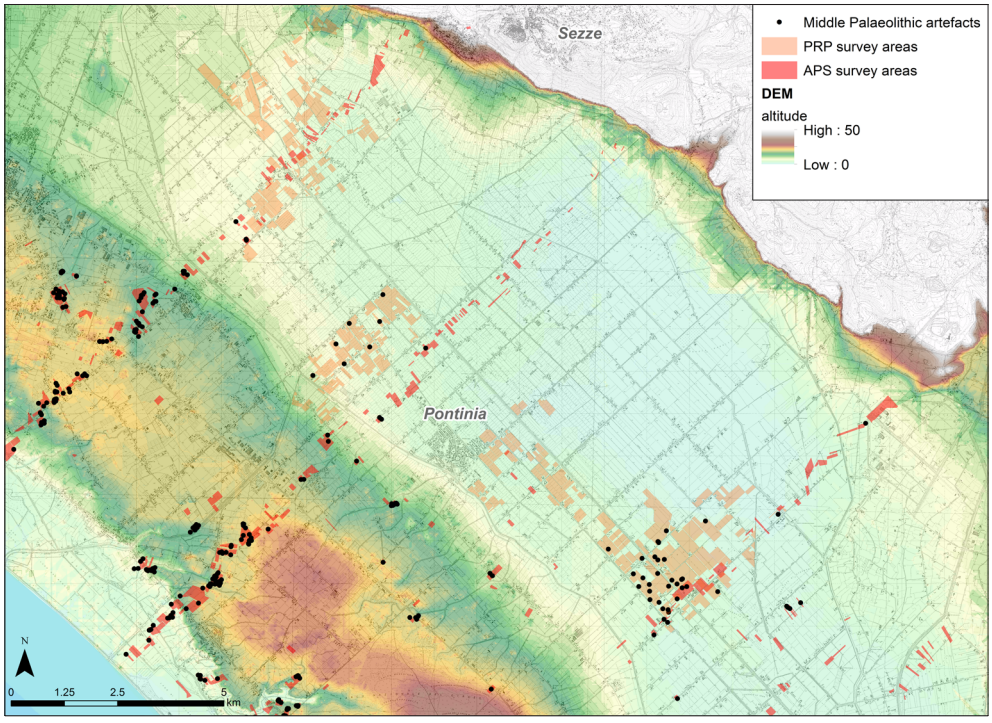

Fig. 6. Distribution of Middle Palaeolithic artefacts (T.C.A. de Haas).

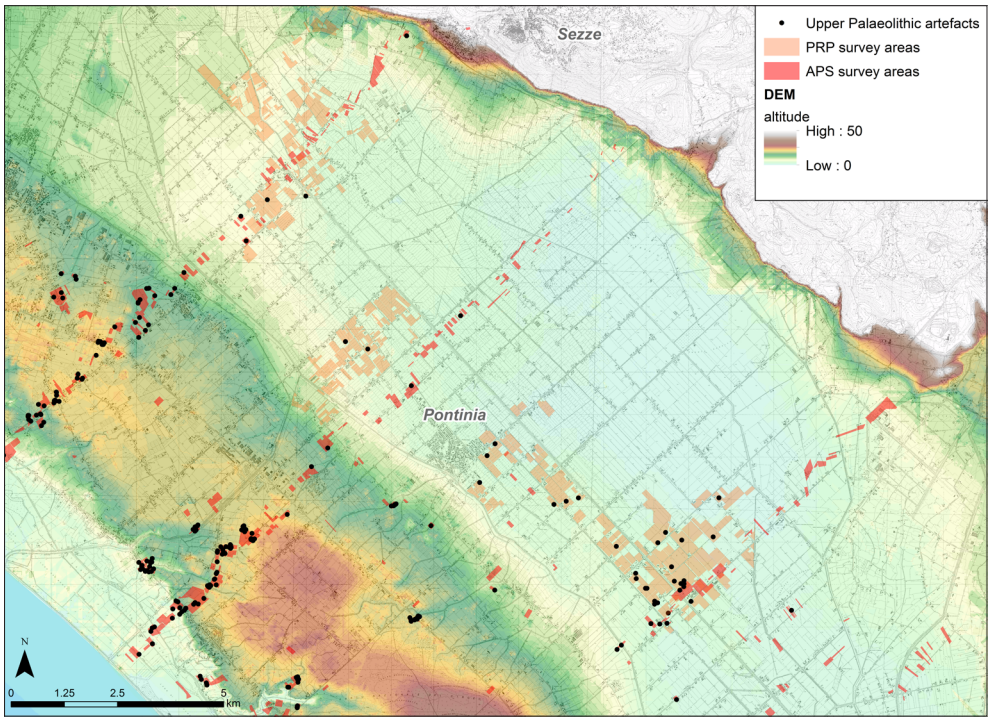

Fig. 7. Distribution of Upper Palaeolithic artefacts (T.C.A. de Haas).

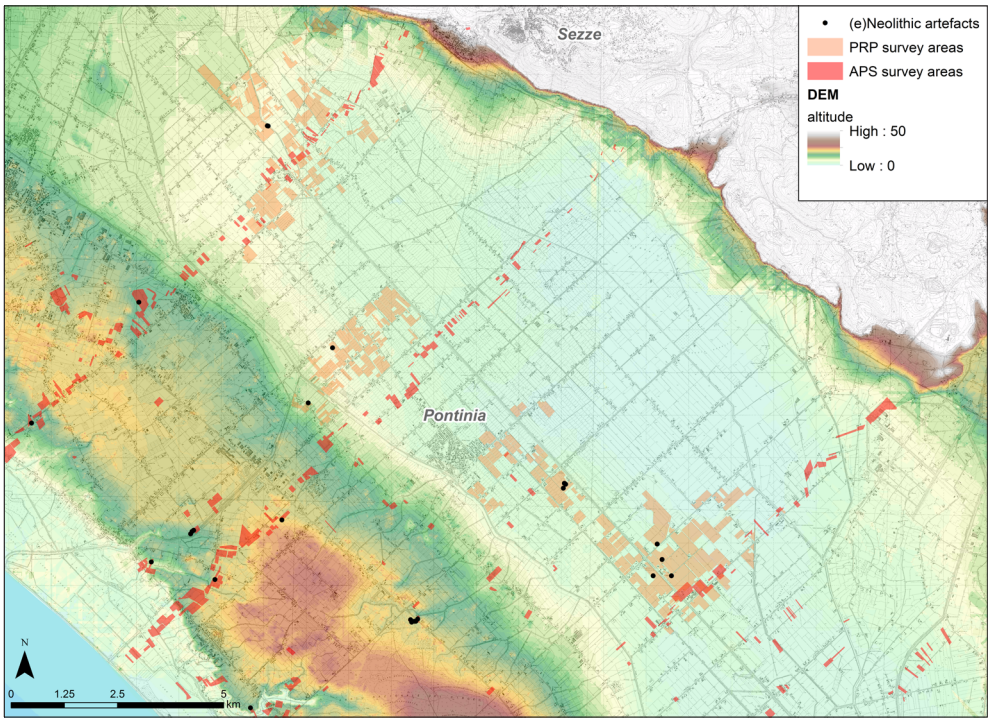

Fig. 8. Distribution of Neolithic/Eneolithic artefacts (T.C.A. de Haas).

recycling tools, as the pebbles used as raw materials were not present in the lower plain, but on the marine terraces) and hunting, as well as the processing of organic materials; the dominance of arrowheads for the Neo/Eneolithic may point to the importance of hunting activities in that period (*cf.* Smit 2010: 52).

4. PALAEOLITHIC OCCUPATION OF THE LOWER PONTINE PLAIN: DISTRIBUTION PATTERNS

In order to understand the exploitation of the lower Pontine Plain in prehistory, we shall now discuss the distribution of lithic artefacts of different periods. In this analysis we shall combine the data from the GIA surveys

with those of the Agro Pontino Survey Project (Voorrips *et al.* 1991; Holstrom *et al.* 2004). However, several methodological remarks should be made in advance.

First, it should be made explicit that the data do not cover the entire lower Pontine Plain; as discussed above, the GIA surveys investigated transects that focused on two Roman sites, *Forum Appii* and *Ad Medias*, supplemented by an additional intermediate transect northwest of present-day Pontinia. These surveys by themselves do not provide data properly representing the landscape's variability in terms of soils, geology and elevation within the plain (see below).

Moreover, in the area directly around Mesa and in the area northwest of present-day Pontinia, intensive gridded surveys were conducted, while in other parts of the lower plain the PRP performed more extensive field-by-field surveys. Whilst in both cases surveyors were instructed to pick up all lithic artefacts, we cannot exclude that lithics were more regularly picked up during the more intensive gridded surveys, and that hence artefact densities in those areas appear to be relatively high.[4]

While the PRP data by itself is thus not representative of the entire area and may be internally biased, the APS project adopted a sampling strategy that was specifically intended to provide representative and consistent data. In combination, the two datasets therefore provide us with a robust basis for evaluating variations in distribution patterns of lithics of different periods, both within the plain and between the lower plain and the marine terraces. In order to combine the two datasets, we have selected from both datasets all artefacts attributed on typological grounds to either the Middle Palaeolithic or the Upper Palaeolithic, and all obsidian artefacts and arrowheads, which are generally dated to the Neolithic/Eneolithic.[5]

Another potential bias concerns the anthropogenic displacement of archaeological materials during the *Bonifica Integrale*, a project undertaken by the Fascist regime in the 1930s to reclaim the Pontine wetland. This reclamation entailed the filling in of small depressions and enriching the poorest soils (*e.g.* solodic planosols) by bringing in more fertile soil (*e.g.* chromic luvisols) from the marine terraces. These activities may have led to the importation of lithic materials, which regularly occur in the fertile soils of the marine terraces.

However, we have good reason to believe that the occurrence of (most of) the lithics in the Pontine graben cannot be explained by such anthropogenic factors. First, the distribution of prehistoric artefacts in the lower Pontine plain is consistent with the surface geology, as they occur in areas where the Borgo Ermada-level deposits are at or near the surface (*cf.* fig. 2 above and figs. 6-8), while areas with younger sediments at the surface lack prehistoric artefacts. In addition, the areas investigated within the PRP almost exclusively concern chromic vertisols and, to a lesser extent, eutric gleysols, and thus not the poorest soils which are most likely to have been enriched with imported soil. Furthermore, hand augering carried out on a series of Roman sites in the area showed no evidence that soil had been brought in to fill in depressions, to improve fertility or to raise the land. Lastly, poorly drained depressions that were apt to be filled in are largely restricted to the valleys with a Holocene fill in the dissected Borgo Ermada level in the southeastern part of the plain (outside the current study area). Land that was raised is mostly encountered in the large Holocene peat area in the central part of the lower plain (north and northeast of Pontinia), and in the peat-filled near-coastal section of the Amaseno river and its smaller tributary valleys, again situated southeast of the present study area.[6]

Whether the distribution of prehistoric artefacts as evidenced by the PRP and APS surveys can be extrapolated across other parts of the lower plain, especially the lowest area northeast of present-day Pontinia, cannot be said with certainty. Although these were, also in the past, the lowest-lying and therefore wettest areas, they may still have provided wetland environments that were very attractive for occupation by hunter-gatherer groups.[7] To the northwest, where more recent fluvio-colluvial deposits occur, remains of the prehistoric landscape may be hidden from sight.

The APS observed a clear preference in the Middle Palaeolithic period for the use of the higher parts of the landscape and/or areas near streams (fig. 6). On the marine terraces, the APS mapped various concentrations of Middle Palaeolithic artefacts, suggesting that numerous camp sites can be found in this higher part of the Pontine Plain. The diverse assemblages observed on them indicate that multiple activities were carried out on these sites, including the production of tools from locally available pebbles (Loving & Kamermans 1991b: 111-112). Only few artefacts were recovered from the lower-lying graben area, and they did not occur as clear concentrations (Loving & Kamermans 1991b: 108-115; *cf.* also Kamermans 1993: 139-146).

The PRP data nuance this picture. Middle Palaeolithic artefacts have been recorded in various parts of the lower plain, although not in all areas where they might be expected. They show a regular distribution northwest of Pontinia, while to the south they only occur as a cluster around Mesa, and the intervening area is empty. Although the distribution in the Mesa area is relatively dense within an area of c. 1.5 sq km, the artefacts still occur as single objects and not as discrete concentrations. Thus, the evidence seems to suggest a more incidental exploitation of locations within the lower plain, with a fairly restricted range of activities being carried out, probably related to the specific resources of the lower plain. It is impossible to say at present whether the traces of Middle Palaeolithic occupation are related to the drier phases with the *Artemisia* steppe or rather to periods when the area was wetter.

For the Upper Palaeolithic period, the overall distribution pattern is slightly different (fig. 7). As it did for the Middle Palaeolithic, the APS recorded various high-density Upper Palaeolithic scatters on the marine terraces, as well as one possible concentration (though of a much lower density) in the lower plain in the Mesa area. Within the lower plain, however, the PRP surveys mapped a much more regular pattern of sparse Upper Palaeolithic artefacts, with a slight concentration in the Mesa area but also some artefacts in the area northwest from Mesa (where no Middle Palaeolithic artefacts are found). Whereas the Upper Palaeolithic artefacts reflect the exploitation of the steppe and/or a wetter landscape, by the Late Upper Palaeolithic parts of the lower plain may already have become a woodland swamp. Thus the distribution of artefacts over the landscape would again suggest an incidental exploitation of the specific resources of the lower plain, as opposed to a more regular occupation of the marine terraces, which saw more diverse activities.

For the Neo/Eneolithic period, much fewer finds have been recorded by the APS and PRP investigations, and their distribution patterns on the marine terraces and lower plain are more similar (fig. 8). However, there are differences both in the types of finds and in their distribution: most of the Neo/Eneolithic artefacts in the lower plain are arrowheads and occur as isolated finds (although there are two locations where two or three artefacts were found in close proximity). By contrast, the artefacts on the marine terraces typologically are more diverse, and there are also some more discrete concentrations on the marine terraces at locations where Neolithic ceramics were found (*cf.* Loving & Kamermans 1991b: 116; Kamermans 1993: 157). It seems likely that for the earliest sedentary or transhumant farming communities, the marine terraces formed a more suitable settlement niche, and the coastal zone may also have played a role in the importation of obsidian from the Pontine islands (Loving & Kamermans 1991b: 112). It seems likely that these farming communities specifically exploited the lower plain, which by this time had become a woodland swamp, as hunting grounds.

The data gathered during the GIA surveys provide evidence for occupation of the lower Pontine Plain over prolonged periods, particularly the Middle Palaeolithic, the (late) Upper Palaeolithic and the Neo/Eneolithic. However, these data cannot be regarded as clear evidence for the presence of spatially discrete sites or activity areas: the items all represent isolated finds rather than concentrations of artefacts, which may result from either behavioural patterns (*e.g.* these artefacts were left behind as single items through occasional loss or through activities that left only few material traces) or from research biases (*e.g.* they are part of denser scatters that failed to be detected as a result of the survey strategy adopted and/or the limited expertise of the fieldwalkers). We would suggest that the former hypothesis is more likely, and that multiple-activity sites leaving larger quantities of artefacts were indeed less common in the lower plain. This area, either as a drier steppe or a wetland, was regularly exploited for its resources in ways that left fewer and more dispersed traces than did the activities on the marine terraces, which at any rate included the processing of locally available pebbles for the production of tools. That being said, even the Middle Palaeolithic and the Neolithic/Eneolithic may have seen specific areas within the lower plain (*e.g.* the area around Mesa) that were preferentially exploited.

5. CONCLUSION

The analysis of the 150 lithic artefacts collected during fieldwalking in the lower Pontine Plain provides valuable insight into prehistoric human occupation of the area. The occurrence of artefacts of Middle and Upper Palaeolithic date indicates the presence of first Neanderthals, and later *Homo sapiens* in the area. Artefacts of these periods generally occur as isolated finds that must reflect activities leaving few material traces, perhaps the occasional presence of mobile hunter-gatherer groups utilizing the specific resources that this steppe and/or wetland environment had to offer. However, we cannot entirely rule out that some of the sparse prehistoric finds in the lower plain actually represent more substantial, discrete scatters of lithic materials, comparable to those on the marine terraces. The dense distributions of lithic artefacts as mapped during the APS suggest that such sites are common on the marine terraces.

Although quantitatively less prominent, additional data on Neolithic/Eneolithic activity was obtained as well, supplementing previously collected environmental evidence that over these periods suggests increasing human interference in the landscape of the Pontine region. Generally this is attributed to the adoption of a sedentary lifestyle, for which the higher parts of the landscape (the marine terraces) were favoured. However, the occasional presence of isolated artefacts dating to these periods in the lower plain suggests that this woodland swamp remained attractive as a hunting ground.

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REFERENCES

ALESSIO, M., F. ALHAIQUE, L. ALLEGRI, A. BIETTI, M. BRANCA, A. D'ARPINO, S. IMPROTA, S. KUHN, A.M. PALMIERI & M. PREITE MARTINEZ, 1993. New results on the upper Palaeolithic site of Riparo Salvini (Terracina, Italy). *Quaternaria Nova* III, 105-150.

ATTEMA, P.A.J. 1993. *An Archaeological survey in the Pontine Region*, PhD thesis, Rijksuniversiteit Groningen.

ATTEMA, P.A.J. & M. VAN LEUSEN 2004. Intraregional and interregional comparison of occupation histories in three Italian regions: the RPC-project. In: S.E. Alcock & J.F. Cherry (eds.), *Side-by-side survey: Comparative Regional Studies in the Mediterranean World*. Oxford, Oxbow, 86-100.

ATTEMA, P.A.J., T.C.A. DE HAAS & M. LA ROSA, 2005. Sites of the Fogliano survey (Pontine Region, central Italy), site classification and a comment on the diagnostic artefacts from Prehistory to the Roman period. *Palaeohistoria* 45/46, 121-196.

ATTEMA, P., H. FEIKEN, T. DE HAAS, G. TOL & M. LA ROSA, 2008. The Astura and Nettuno surveys of the Pontine Region Project (2003 – 2005): 1st interim report. *Palaeohistoria* 49/50, 415-516.

ATTEMA, P., G.-J. BURGERS & M. VAN LEUSEN, 2010. *Regional pathways to complexity*. Amsterdam, Amsterdam University Press.

ATTEMA, P.A.J., T.C.A. DE HAAS & G.W. TOL, 2011. *Between Satricum and Antium. Settlement dynamics in a coastal landscape in Latium Vetus* (Babesch Supplementa Series 18). Leuven, Peeters.

BAILEY, G., 2007. Time perspectives, palimpsests and the archaeology of time. *Journal of Anthropological Archaeology* 26, 198-223.

BIETTI, A., 1976-1977. Analysis and illustration of the Epigravettian industry collected during the 1955 excavations at Palidoro (Rome, Italy). *Quaternaria* 19, 197-387.

BIETTI, A. & S. GRIMALDI, 1996. Small flint pebbles and mousterian reduction chains: the case of southern Latium (Italy). *Quaternaria Nova* VI, 237-260.

BLANC, A.C., 1939. Un giacimento aurignaziano medio nella Grotta del Fossellone al Monte Circeo. In: L. Silla (ed.), *Atti XXVII Riunione della Società Italiana per il Progresso delle Scienze, Bologna, 4–11 settembre 1938.* Roma, SIPS, 215-221.

BLANC, A.C. & A.G. SEGRE, 1953. *Excursion au Mont Circé*. Livret-Guide au IV Congr. Int. INQUA, Roma-Pisa.

BORDES, F., 1961. *Typologie du Paléolitique ancien et moyen.* Bordeaux, Delmas.

DE HAAS, T.C.A., 2011. *Fields, farms and colonists. Intensive field survey and early Roman colonization in the Pontine region, central Italy* (Groningen Archaeological Studies 15). Eelde/Groningen, Barkhuis.

EISNER, W.R. & H. KAMERMANS, 2004. Late Quaternary vegetation history of Latina, Italy: a Final Report on the Mezzaluna core. In: S. Holstrom, A. Voorrips & H. Kamermans (eds.), *The Agro Pontino Archaeological Survey* (Archaeological Studies Leiden University 11). Leiden, Universiteit Leiden (CD-ROM).

FEIKEN, H. 2011. Geology and geomorphology of the Nettuno area. In: P. Attema, T. De Haas & G. Tol (eds.), *Between Satricum and Antium.* Peeters, Leuven, 1-8.

FEIKEN, H., 2014. *Dealing with biases. Three geo-archaeological approaches to the hidden landscapes of Italy*, PhD thesis, Rijksuniversiteit Groningen.

HOLSTROM, S., A. VOORRIPS & H. KAMERMANS, 2004. *The Agro Pontino Archaeological Survey* (Archaeological Studies Leiden University 11). Leiden, Universiteit Leiden (CD-ROM).

HUNT, C. & W. EISNER, 1991. Palynology of the Mezzaluna core. In: A. Voorrips, S. Loving & H. Kamermans (eds.), *The Agro Pontino Survey Project*. Amsterdam, Universiteit van Amsterdam 49-59.

KAMERMANS, H., 1993. *Archeologie en landevaluatie in de Agro Pontino (Lazio, Italië)*, PhD thesis, Universiteit van Amsterdam.

KUHN, S., 1995. *Mousterian Lithic Technology. An Ecological Perspective*. Princeton, Princeton University Press.

LAMBECK, K., F. ANTONIOLI, A. PURCELL & S. SILENZI, 2004. Sea level change along the Italian coast for the past 10.000 yr, *Quaternary Science Reviews* 23, 1567-1598.

LA ROSA, M., 1984. L'insieme litico pontiniano del Podere La Rosa (Borgo S. Maria-Latina). *Studi per l'ecologia del Quaternario* 6, 9-27.

LA ROSA, M., P. MAZZA, M. RUSTIONI & F. VIANELLO, 1989-1990. Agro Pontino (prov. di Latina e Roma). *Notiziario della Rivista di Scienze Preistoriche* 42, 356-359.

LA ROSA, M., 1998. The earliest Palaeolithic industries of the Agro Pontino (Latina, Central Italy). *Papers from the European Association of Archaeologists third Annual Meeting at Ravenna 1997, vol. I: Pre- and Protohistory, BAR International Series*, Oxford, Archaeopress, 6-10.

LA ROSA, M., 2002. La Preistoria. In: F. Tetro (ed.), *Il territorio pontino dalla Preistoria alle Bonifiche. Materiali per il Catalogo.* Latina, Comune di Latina, 37-48.

LA ROSA, M., 2011. Prehistory. In: P. Attema, T. De Haas & G. Tol (eds.), *Between Satricum and Antium.* Peeters, Leuven, 39-42.

LOVING, S., H. KAMERMANS. & A. VOORRIPS, 1991. Randomizing our walks: the Agro Pontino survey sampling design. In: A. Voorrips, S. Loving & H. Kamermans (eds.), *The Agro Pontino Survey Project*. Amsterdam, Universiteit van Amsterdam, 61-78.

LOVING, S. & H. KAMERMANS, 1991a. Field trials and errors: field methods used in the Agro Pontino Survey. In: A. Voorrips, S. Loving & H. Kamermans (eds.), *The Agro Pontino Survey Project. Methods and preliminary results*. Amsterdam, Instituut voor Pre- en Protohistorische Archeologie, 79-86.

LOVING, S. & H. KAMERMANS, 1991b. Figures from flint: first analyses of lithic artefacts collected by the Agro Pontino Survey. In: A. Voorrips, S. Loving & H. Kamermans (eds.), The Agro Pontino Survey Project. Methods and preliminary results. Amsterdam, Instituut voor Pre- en Protohistorische Archeologie, 99-116.

MERCURI, A.-M., C. ACCORSI & M. BANDINI MAZZANTI, 2002. The long history of *cannabis* and its cultivation by the Romans in central Italy, shown by pollen records from Lago Albano and Lago di Nemi. *Vegetation History and Archaeobotany* 11, 263-276.

NIEKUS, M., D. STAPERT, J. BEUKER & L. JOHANSEN, 2011. A new site of the Mousterian Acheulian tradition in the northern Netherlands. *Quartär* 58, 67-92.

PERETTO, C., M. LA ROSA, A. LIBONI, S. MILLIKEN, M. SOZZI & A. ZARATTINI, 1997. Le gisement de Quarto delle Cinfonare dans le cadre du Paléolitique inférieur de l'Italie ouest-centrale. *L'Anthropologie* 101, 4, 597-615.

SCHWARZ, H.P., W. BUHAY, R. GRUN, M. STINER, S. KUHN & G.H. MILLER, 1990-1991. Absolute dating of sites in coastal Lazio. *Quaternaria Nova* I, 51-67.

SEVINK, J., P. VOS, E. WESTERHOFF, A. STIERMAN & H. KAMERMANS, 1982. A sequence of marine terraces near Latina (Agro Pontino, central Italy). *Catena* 9, 361-378

SEVINK, J., A. REMMELZWAAL & O. SPAARGAREN, 1984. *The soils of southern Lazio and adjacent Campania*. Amsterdam, Universiteit van Amsterdam.

SEVINK, J., J. VAN DER PLICHT, H. FEIKEN, P.M. VAN LEUSEN & C.C. BAKELS, 2013. The Holocene of the Agro Pontino graben: Recent advances in its palaeogeography, palaeoecology, and tephrostratigraphy. *Quaternary International* 303, 153-162.

SMIT, B., 2011. *Valuable flints. Research strategies for the study of early prehistoric remains from the late Pleistocene soils of the northern Netherlands*. Groningen.

TASCHINI, M., 1979. L'industrie lithique de Grotta Guattari au Mont Circé (Latium): definition culturelle, typologique et chronologique du Pontinien. *Quaternaria* 21, 179-247.

TIXIER, J., M.L. INIZAN & H. ROCHE, 1980. *Prehistoire de la pierre taillée. I: terminologie et tecnologie.* Antibes, Ed. du C.R.E.P.

TOL, G.W., 2012. *A fragmented history. A methodological and artefactual approach to the study of ancient settlement in the territories of Satricum and Antium* (Groningen Archaeological Studies 18). Eelde/Groningen, Barkhuis.

TOL, G., T. DE HAAS, K. ARMSTRONG & P. ATTEMA, 2014. Minor centres in the Pontine plain: the cases of *Forum Appii* and *Ad Medias*, *Papers of the British School at Rome*, 82, 109-134.

TOL, G.W., T.C.A. DE HAAS & P.A.J. ATTEMA (eds.) (forthcoming). *The Role of Minor Centers in the Economy of Roman Central Italy: the cases of Ad Medias, Forum Appii and Astura*. Eelde/Groningen, Barkhuis.

VITAGLIANO, S. & M. PIPERNO, 1990-1991. Lithic industry of level 27 beta of the Fossellone Cave (S. Felice Circeo, Latina). *Quaternaria Nova* I, 289-304.

VOORRIPS, A., S.H. LOVING & H. KAMERMANS, 1991. *The Agro Pontino Survey Project* (Studies in Prae- en Protohistorie 6). Amsterdam, Universiteit van Amsterdam.

WALSH, K., P. ATTEMA, T. DE HAAS, 2014. The Pontine marshes (Central Italy). A case study in wetland historical ecology. *Babesch* 89, 27-46.

NOTES

1 Following Bietti 1976-1977 and Taschini 1979, debris is defined as all flakes and fragments with maximum dimensions equal to or smaller than 15 mm.

2 All artefacts indicated as "possibly" pertaining to a period in appendix 1 have been included as "Undated" in table 1 – which thus only assigns the certainly dated artefacts to a specific period.

3 Following Bietti 1976-1977, microliths are here defined as all pieces on bladelets with a width smaller than 9 mm.

4 While the gridded surveys and the extensive surveys each account for c. 50% of the datable lithics, the extensive survey covered an area more than two-and-a-half times the size of that covered by the gridded surveys and thus recovered far fewer lithic artefacts per hectare. However, as this overrepresentation of lithics in gridded surveys mainly concerns MP artefacts in the Mesa area, it is well possible that we are dealing with genuine spatial patterning rather than with a methodological bias.

5 For the APS, this entailed selecting artefacts from the database as published in Holstrom *et al.* 2004 with a Bietti typological attribution for the Upper Palaeolithic, and those of Bordes-typology for the Middle Palaeolithic (hence not following the dating criteria as given in Loving & Kamermans 1991b: table 2); identical attributions were applied by the first author to the materials from the GIA surveys. We noted some discrepancies between the distribution of these dated artefacts and the distribution of sites as defined by the APS (*cf.* Kamermans 1993: 121-122 for the criteria), and, for comparative purposes (the GIA survey data do not allow us to interpret the finds in terms of sites in a similar way) deem the artefact-based data more suitable.

6 Sevink, pers. comm.

7 Recently, lithic artefacts have indeed been recorded in the lower-lying parts of the plain (Sevink, pers. comm.).

APPENDIX 1

INVENTORY OF LITHIC FRAGMENT FROM THE LOWER PONTINE PLAIN

The following table lists all individual lithic artefacts collected during PRP field surveys in the lower Pontine plain. The table is ordered geographically from northwest to southeast, distinguishing four surveyed areas: the area around Borgo Faiti (ancient *Forum Appii*), the transect surveyed in 2007 northwest of Pontinia, the areas surveyed southeast of Pontinia and, finally, the surroundings of Mesa di Pontinia (ancient *Ad Medias*) (cf. figs. 1 and 6-8 in the main text). The code in the first column represents the individual artefact ID, which is composed of the survey unit ID (either a six or a 4-digit number), the sample ID and an individual artefact number (cf. De Haas 2011: 333 for the transect northwest of Pontinia and Tol *et al.* forthcoming for the other areas). The formal tools are described according to the standard Bordeaux taxonomy (Bordes 1961; Bietti 1976-1977), while the debitage is classified according to the definitions introduced by J. Tixier (Tixier *et al.* 1980; see also Bietti 1976-1977).

Area around Borgo Faiti		
101526/01/01	Notched bladelet	Late Upper Palaeolithic
101541/01/01	Unretouched blade	Upper Palaeolithic
101844/01/01	Arrowhead	Neo/Eneolithic
101846/01/01	Leaf-shaped tool	Neo/Eneolitico
101846/01/02	Flake	-
101847/01/01	Flake	-
101848/01/01	Alternate borer burin	Middle Palaeolithic?
102725/05/02	Flake	-
102845/01/01	Globular core	-
Transect northwest of Pontinia		
1226/01/10	Simple convex sidescraper	Middle Palaeolithic
1234/01/01	Centripetal core	Middle Paleolithic
1317/01/01	*Esquillé* tool	-
1436/01/01	Simple convex sidescraper	Middle Palaeolithic
1438/01/02	Flake	-
1443/01/01	Shapeless core	-
1475/01/05	Levallois flake	Middle Palaeolithic
1475/01/06	Simple convex sidescraper	Middle Palaeolithic
1499/01/01	Simple straight sidescraper (fig. 2, no. 2)	Middle Palaeolithic
1500/01/02	Flake	-
1542/01/01	Flake	-
1543/01/01	Flake	-
1546/01/01	Flake	-
1546/01/02	Simple straight sidescraper	Middle Palaeolithic
1547/01/01	Fragment of unretouched blade	Upper Palaeolithic
1550/01/01	Flake	-
1552/01/01	Retouched flake	-
1626/01/01	Fragment of core	-
1643/01/01	Flake	-
1655/01/01	Flake	-
1714/01/02	Debris	-
1752/01/01	Fragment of core	-
1792/01/01	Fragment of backed tool	Upper Palaeolithic
1805/01/01	Retouched flake	Middle Palaeolithic
1807/01/02	Flake on obsidian	Neo/Eneolithic
1810/01/01	Flaked pebble	-
1840/01/01	Bladelet core on obsidian	Neo/Eneolithic
Area southeast of Pontinia		
102106/02/01	Bladelet core	Late Upper Palaeolithic
102203/02/01	Unretouched blade	Upper Palaeolithic
102210/01/01	Flake	-
102212/01/01	Flake (Levallois?)	Middle Palaeolithic?
102131/02/01	Unretouched bladelet	Upper Palaeolithic

Area around Ad Medias/Mesa		
100033/01/01	Pseudo-levallois point	Middle Palaeolithic
100075/01/01	Fragment of leaf-shaped tool	Neo/Eneolithic
100087/01/02	Flake	-
100113/02/01	Arrowhead (fig. 2, no. 8)	Neo/Eneolithic
100137/01/01	Unretouched blade	Upper Palaeolithic
100153/01/01	Simple straight sidescraper	Middle Palaeolithic
100181/01/01	Notched bladelet	Late Upper Palaeolithic
100183/01/01	*a dos aminci* sidescraper (fig. 2, no. 1)	Middle Palaeolithic
100208/01/02	Pseudo-levallois point	Middle Palaeolithic
100210/01/01	Flake	-
100223/01/01	*à cran* point (fig. 2, no. 5)	Upper Palaeolithic
100223/01/02	Retouched blade	Upper Palaeolithic
100231/01/01	Ridged bladelet	Upper Palaeolithic
100232/01/01	Flake	Middle Palaeolithic?
100237/01/01	Levallois flake	Middle Palaeolithic
100250/01/01	Levallois flake	Middle Palaeolithic
100258/01/01	Borer	Upper Palaeolithic
100283/01/01	*Déjeté* sidescraper	Middle Palaeolithic
100284/01/01	Backed bladelet	Late Upper Palaeolithic
100284/01/02	Retouched flake	-
100294/01/01	Retouched flake	-
100311/01/01	Flake	-
100355/01/01	Unretouched blade	Upper Palaeolithic
100355/01/02	Angle burin on truncation	Upper Palaeolithic
100356/01/01	Flake	-
100363/01/01	Simple convex sidescraper	Middle Palaeolithic
100364/01/01	Flake	-
100364/01/02	Retouched flake	-
100368/01/01	Fragment of unretouched blade	Upper Palaeolithic
100382/01/01	Backed bladelet (fig. 2, no. 7)	Late Upper Palaeolithic
100388/01/01	Flakes	-
100388/01/02	Flake	-
100396/01/01	Unretouched blade	Upper Palaeolithic
100401/01/01	Retouched blade	Upper Palaeolithic
100425/01/01	Simple convex sidescraper	Middle Palaeolithic
100444/01/01	Retouched blade	Upper Palaeolithic
100452/01/01	Simple convex sidescraper	Middle Palaeolithic
100513/01/01	Core with preferential Levallois flake	Middle Palaeolithic
100564/01/01	Flake	-
100596/01/01	Flake	-
100637/01/01	Levallois flake	Middle Palaeolithic
100641/01/01	Flake	-
100665/01/01	Angle burin on fracture	Upper Palaeolithic
100676/01/01	Flake	-
100679/01/01	Retouched blade	Upper Palaeolithic
100724/01/01	Levallois flake	Middle Palaeolithic
100783/01/01	Simple convex sidescraper (fig. 2, no. 3)	Middle Palaeolithic
100790/01/01	Flake	-
100799/01/01	Flake	-
100820/01/01	Pseudo-levallois point	Middle Palaeolithic
101161/01/01	Levallois flake	Middle Palaeolithic
101267/01/01	Flake	-
101277/01/01	Retouched flake	-
101282/01/01	Pseudo-prismatic core	Middle Palaeolithic
101284/01/01	Arrowhead (fig. 2, no. 12)	Neo/Eneolithic
101379/01/01	Double sidescraper	Middle Palaeolithic
101387/01/01	Centripetal core (fig. 2, no. 4)	Middle Palaeolithic
101671/01/01	Centripetal core	Middle Palaeolithic
101709/02/03	Debris	-
101718/01/01	Flake	-
101720/01/01	Backed blade	Upper Palaeolithic

Area around Ad Medias/Mesa		
102004/02/01	Unretouched bladelet	Upper Palaeolithic
102006/02/02	Flake	-
102037/01/01	Flake	-
102057/01/01	Sidescraper with inverse retouch	Middle Palaeolithic
102062/01/02	Core with preferential levallois flake (fig. 2, no. 6)	Middle Palaeolithic
102169/02/01	Flake	-
102191/01/01	Truncated bladelet (fig. 2, no. 10)	Late Upper Palaeolithic
102274/01/01	Flake	-
102276/01/01	Arrowhead	Neo/Eneolithic
102278/01/01	Arrowhead (fig. 2, no. 9)	Neo/Eneolithic
102279/01/01	Arrowhead	Neo/Eneolithic
102286/01/01	Angle burin on truncation (fig. 2, no. 11)	Upper Palaeolithic
102301/02/01	Laminar flake	Upper Palaeolithic?
102407/02/04	Pointed backed bladelet	Late Upper Palaeolithic
102409/03/02	Flake	-
102461/01/03	Arrowhead	Neo/Eneolithic
102462/01/03	Flake	-
102464/01/01	Flake	-
102464/01/02	Flake	-
102464/01/03	*Esquillé* tool	-
102465/02/03	Centripetal core	Middle Palaeolithic
102467/02/01	End scraper on small flake	Upper Palaeolithic
102470/01/01	Flake	Middle Palaeolithic?
102478/01/01	Flake	-
102502/02/01	Flake	-
102504/01/01	Angle burin on fracture	Upper Palaeolithic
102505/01/01	Flake (levallois?)	Middle Palaeolithic
102514/01/01	Flake	-
102520/01/01	Notched blade	Upper Palaeolithic
102528/01/01	Flake	-
102535/01/01	Flake	-
102565/02/01	Truncated tool	-
102569/01/05	Fragment of core	-
102569/01/07	Flake	-
102569/01/09	'Déjeté' axial dihedral burin	Upper Palaeolithic
102569/01/12	Angle burin on truncation	Upper Palaeolithic
102570/01/01	Transversal concave sidescraper	Middle Palaeolithic
102570/01/02	Bifacial chopper on small pebble	Middle Palaeolithic
102573/01/01	Flake	-
102576/01/03	Flake	-
102577/02/03	Unretouched blade	Upper Palaeolithic
102590/01/01	Pseudo-levallois point	Middle Palaeolithic
102590/01/03	Flake	-
102604/01/01	Transversal burin on truncation	Upper Palaeolithic
102934/03/01	Retouched flake	-
102935/03/07	Retouched blade	Upper Palaeolithic
102944/03/03	Retouched flake	-
102956/02/07	Flake	-